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II.   REMARKS

Claims 83, 88-94, 96, 97, 117, 123-124, 152-153, 155-156, 158, 161-163, and 180-294 are currently pending in the application, of which claims 83, 117, 152, 161, 180, 200, 220, 223, 229, 233, 237, 240, and 243 are independent claims.

Applicants respectfully submit that the above amendments do not add new matter to the application and are fully supported by the specification. Support for the amendments may be found at least in Figure 7 and at page 16, line 11 to page 17, line 18 of the specification.

In view of the above Amendments and following Remarks, Applicants respectfully request reconsideration and timely withdrawal of the pending objections and rejections for the reasons discussed below.

A.   Allowable Subject Matter

Applicants appreciate the indication of allowable subject matter in claims 83, 88-94, 96, 97, 117, 123, 124, 152, 153, 155, 156, 158 and 161-163. Claims 83, 117, 152, and 161 have been amended.

B.   The Current Art Rejections

Claims 180, 181, 183-185, 187-190, 192-201, 203-205, 207-210, 212-219, 233, 234 and 237-244 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over U.S. Patent No. 6,108,369 issued to Ovesjo, *et al.* ("Ovesjo") in view of U.S. Patent No. 5,734,647 issued to Yoshida, *et al.* ("Yoshida").

Claims 182, 186, 191, 202, 206, 211, 220-232, 235, 236 and 245-247 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Ovesjo in view of Yoshida and further in view of U. S. Patent No. 6,009,091 issued to Stewart, *et al.* ("Stewart"). Applicants respectfully disagree for at least the following reasons.

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The Office Action, in each of the rejections, relies on Ovesjo to disclose spreading codes applied to multiple channels (split between in-phase and quadrature-phase data in pairs) and the use of the OVSF codes (e.g., $C_{4,1}$, $C_{4,2}$, $C_{4,3}$ and $C_{4,4}$ of Ovesjo).[1] The Office Action then recognizes that Ovesjo does not disclose using the same spreading code to an I channel and an Q channel.

The Office Action then relies on Yoshida for a teaching of using of the same spreading code to the I and Q channels. The Office Action then concludes that it would have been obvious to "use the same spreading code for each I and Q pair as taught by Yoshida in the method of Ovesjo to minimize the number and complexity of spreading codes used. This in turn would allow the data rate to be at a maximum." Then, without citation, the Office Action concludes "When three data channels are used, the first, second, and third data channels are used." The Office Action's analysis is both incorrect and insufficient to demonstrate the obviousness of the previously presented claims.

As described below in reference to specific claims, Ovesjo fails to disclose a system for assigning specific spreading codes to specific data channels where two data channels are assigned one spreading code and the third is assigned a different one. Yoshida simply cannot make up for that deficiency because, at most, Yoshida teaches use of the *same spreading code* for every channel. Neither Ovesjo nor Yoshida disclose a system in which two data channels have applied a first sequence and a third data channel has applied a second spreading sequence. It just simply is not disclosed in either reference individually.

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[1] The present application, including the pending claims, uses the OVSF code numbering of ($C_{4,0}$, $C_{4,1}$, $C_{4,2}$ and $C_{4,3}$) for the same OVSF codes.

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Moreover, the Office Action has provided no motivation or suggestion as to why one of ordinary skill in the art would be motivated to choose to use a first spreading code for two channels and a second spreading code for a third channel. Ovesjo suggests using *different spreading codes* on *every channel* and Yoshida suggests using the *same spreading* code on *every channel*. There is no reason identified in the Office Action as to why the person of ordinary skill in the art would deviate from one of those two specifically suggested techniques - different spreading code on every channel or same spreading code on every channel.

More importantly, neither Ovesjo nor Yoshida teaches or suggests using an OVSF code with a spreading factor of 4 and a code number of 1, i.e., $C_{4,1}$ for the first two data channels and an OVSF code with a spreading factor of 4 and a code number of 3, i.e., $C_{4,3}$, for the third data channel.[2] The Office Action fails to identify why one of ordinary skill in the art would have been motivated to use the specific codes of $C_{4,1}$ for the two channels and $C_{4,3}$ for the third. Indeed, logically, if we assume that one of ordinary skill in the art could expect that the first code to be used to be $C_{4,1}$, not $C_{4,0}$, then one would expect that the second code to be used to be $C_{4,2}$, because $C_{4,1}$ and $C_{4,2}$ are sequential to one another in the OVSF code tree.

As supported by Figure 7 and page 16, line 11 to page 17, line 18 of the originally filed specification, in one of the embodiments, a spreading code $C_{4,1}$ is allocated to Channel 1 (DPDCH 1) and Channel 2 (DPDCH 2); a spreading code $C_{4,3}$ is allocated to Channel 3 (DPDCH 3) and Channel 4 (DPDCH 4); and a spreading code $C_{4,2}$ is allocated to Channel 5 (DPDCH 5) and Channel 6 (DPDCH 6). And, if two channels are used, Channels 1 and 2

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[2] As noted above, the present application, including the pending claims, uses the OVSF code numbering of $(C_{4,0}, C_{4,1}, C_{4,2}$ and $C_{4,3})$.

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are used. If three channels are used, Channels 1, 2 and 3 are used. If four channels are used, Channels 1, 2, 3 and 4 are used. If five channels are used, Channels 1, 2, 3, 4, and 5 are used. If six channels are used, Channels 1, 2, 3, 4, 5, and 6 are used. The references cited fail to disclose or suggest this feature.

Thus, the Office Action fails to present a *prima facie* case of obviousness of any of the claims, as explained below.

1. Independent Claim 180 is Patentable Over the Combination of Ovesjo and Yoshida

Claim 180 recites a spreading method for a mobile station comprising: "spreading a first one of the data channels by $C_{4,1}$; spreading a second one of the data channels by $C_{4,1}$; and spreading a third one of the data channels by $C_{4,3}$, wherein . . . *when three and not more than three of the data channels are used, the first one of the data channels, the second one of the data channels, and the third one of the data channels are used.*" Here, "[a data channel] is used" means that that data is transmitted using the data channel or the data channel is transmitted. As discussed above, claim 180 recites a first one and second one of the data channels being spread by a first spreading code, here $C_{4,1}$, and a third one of the data channels being spread by a second spreading code, which here is specifically identified as $C_{4,3}$, when three and not more than three of the data channels are used, the first one of the data channels, the second one of the data channels, and the third one of the data channels are used. In addition to the failure of the Office Action to identify why one of ordinary skill in the art would have been motivated to use one spreading code for two channels and another spreading code for a third channel based on Ovesjo and Yoshida, the Office Action also fails to identify why it would have been obvious to modify the already defective combination of Ovesjo and Yoshida to *use the*

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specific codes of $C_{4,1}$ for the first one and the second one of the data channels and $C_{4,3}$ for

the third one of the data channels, when three and not more than three of the data channels

are used, the first one of the data channels, the second one of the data channels, and the third

one of the data channels are used. Indeed, logically, when two codes are used and the first code

to be used is $C_{4,1}$, one would expect that *the second code to be used to be $C_{4,2}$, not $C_{4,3}$*, because

$C_{4,1}$ and $C_{4,2}$ are sequential to one another in the OVSF code tree. Accordingly, for all of these

reasons, the rejection of claims 180 and its dependent claims should be withdrawn.

2. Independent Claim 200 is Patentable Over the Combination of Ovesjo and
    Yoshida

Claim 200 recites a spreading method for a mobile station comprising: "allocating $C_{4,1}$ to

a first one of the data channels; allocating $C_{4,1}$ to a second one of the data channels; and

allocating $C_{4,3}$ to a third one of the data channels, wherein *when three and not more than three*

of the data channels are used, the first one of the data channels, the second one of the data

channels, and the third one of the data channels are used, and $C_{I,K}$ represents an orthogonal

variable spreading factor code, with I being a spreading factor and K being a code number,

wherein $0 \leq K < I$." Here, "[a data channel] is used" means that data is transmitted using the data

channel or that the data channel is transmitted. As similarly discussed above with respect to

claim 180, claim 200 recites allocating a first spreading code, here $C_{4,1}$, to the first one and the

second one of the data channels and allocating a second spreading code, which here is

specifically identified as $C_{4,3}$, to the third one of the data channels, wherein when three and not

more than three of the data channels are used, the first one of the data channels, the second one

of the data channels, and the third one of the data channels are used. In addition to the failure of

the Office Action to identify why one of ordinary skill in the art would have been motivated to

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use one spreading code for two channels and another spreading code for a third channel based on

Ovesjo and Yoshida, the Office Action also fails to identify why it would have been obvious to

modify the already defective combination of Ovesjo and Yoshida to *allocate the specific codes*

of $C_{4,1}$ to the first one and second one of the data channels and $C_{4,3}$ to the third one of the

data channels, when three and not more than three of the data channels are used, the first one

of the data channels, the second one of the data channels, and the third one of the data

channels are used. Indeed, logically, when two codes are used and the first code to be used to

be $C_{4,1}$, one would expect that ***the second code to be used to be $C_{4,2}$, not $C_{4,3}$***, because $C_{4,1}$ and

$C_{4,2}$ are sequential to one another in the OVSF code tree. Accordingly, for all of these reasons,

the rejection of claims 200 and its dependent claims should be withdrawn.

3.   Independent Claim 220 is Patentable Over the Combination of Ovesjo, Yoshida
and Stewart

Claim 220 recites a mobile station comprising: "means for spreading a first one of the

data channels by $C_{4,1}$, a second one of the data channel by $C_{4,1}$, a third one of the data channels

by $C_{4,3}$, a fourth one of the data channels by $C_{4,3}$, a fifth one of the data channels by $C_{4,2}$, a sixth

one of the data channels by $C_{4,2}$, *wherein the first one of the data channels, the second one of*

the data channels, and the third one of the data channels are configured to be used when

three and not more than three of the data channels are configured to be used." Here, [a data

channel is] configured to be used" means that data is configured to be transmitted using the data

channel or that the data channel is configured to be transmitted. As similarly discussed above,

claim 220 recites the first one and the second one of data channels being configured to be spread

by a first spreading code, here $C_{4,1}$, and the third one of the data channels being configured to be

spread by a second spreading code, which here is specifically identified as $C_{4,3}$, wherein the first

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one of the data channels, the second one of the data channels, and the third one of the data

channels are configured to be used when three and not more than three of the data channels are

configured to be used. In addition to the failure of the Office Action to identify why one of

ordinary skill in the art would have been motivated to use one spreading code for two channels

and another spreading code for a third channel based on Ovesjo and Yoshida, the Office Action

also fails to identify why it would have been obvious to modify the already defective

combination of Ovesjo and Yoshida to *use the specific codes of $C_{4,1}$ for the first one and the*

second one of the data channels and $C_{4,3}$ for the data on the third one of the data channels,

wherein the first one of the data channels, the second one of the data channels, and the third

one of the data channels are configured to be used when three and not more than three of the

data channels are configured to be used. Indeed, logically, when two codes are used and the

first code to be used is $C_{4,1}$, one would expect that *the second code to be used to be $C_{4,2}$, not $C_{4,3}$*,

because $C_{4,1}$ and $C_{4,2}$ are sequential to one another in the OVSF code tree. Accordingly, for all

of these reasons, the rejection of claims 220 and its dependent claims should be withdrawn.

4.   Independent Claim 223 is Patentable Over the Combination of Ovesjo, Yoshida
and Stewart

Claim 223 recites an apparatus for a mobile communication system comprising "a first

spreading unit configured to spread a first one of the data channels by $C_{4,1}$; a second spreading

unit configured to spread a second one of the data channels by $C_{4,1}$; a third spreading unit

configured to spread a third one of the data channels by $C_{4,3}$; a fourth spreading unit configured

to spread the at least one control channel by $C_{256,0}$, . . . wherein *the first one of the data*

channels, the second one of the data channels, and the third one of the data channels are

configured to be used when three and not more than three of the data channels are configured

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to be used." Here, "[a data channel is] configured to be used" means that data is configured to be transmitted using the data channel or that the data channel is configured to be transmitted. As discussed above, claim 223 recites the first one and the second one of the data channels being spread by a first spreading code, here $C_{4,1}$, and the third one of the data channels being spread by a second, which here is specifically identified as $C_{4,3}$, wherein the first one of the data channels, the second one of the data channels, and the third one of the data channels are configured to be used when three and not more than three of the data channels are configured to be used. In addition to the failure of the Office Action to identify why one of ordinary skill in the art would have been motivated to use one spreading code for two channels and another spreading code for a third channel based on Ovesjo and Yoshida, the Office Action also fails to identify why it would have been obvious to modify the already defective combination of Ovesjo and Yoshida to *use the specific codes of $C_{4,1}$ for the first one and the second one of the data channels and $C_{4,3}$ for the third one of the data channels, wherein the first one of the data channels, the second one of the data channels, and the third one of the data channels are configured to be used when three and not more than three of the data channels are configured to be used.* Indeed, logically, when two codes are used and the first code to be used is $C_{4,1}$, one would expect that *the* <u>**second code to be used to be $C_{4,2}$, not $C_{4,3}$**</u>, because $C_{4,1}$ and $C_{4,2}$ are sequential to one another in the OVSF code tree. Accordingly, for all of these reasons, the rejection of claims 223 and its dependent claims should be withdrawn.

     5.   **Independent Claim 229 is Patentable Over the Combination of Ovesjo, Yoshida and Stewart**

Claim 229 recites a mobile station comprising: "an allocation unit configured to allocate first data to a first one of the data channels, second data to a second one of the data channels,

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third data to a third one of the data channels, fourth data to a fourth one of the data channels,

fifth data to a fifth one of the data channels, and sixth data to a sixth one of the data channels,

and control data to the at least one control channel, respectively; a first multiplier configured to

multiply the first data by $C_{4,1}$; a second multiplier configured to multiply the second data by $C_{4,1}$;

a third multiplier configured to multiply the third data by $C_{4,3}$; a fourth multiplier configured to

multiply the fourth data by $C_{4,3}$; a fifth multiplier configured to multiply the fifth data by $C_{4,2}$; a

sixth multiplier configured to multiply the sixth data by $C_{4,2}$; and a seventh multiplier configured

to multiply the control data by $C_{256,0}$, wherein . . . *the first one of the data channels, the second*

one of the data channels, and the third one of the data channels are configured to be used

when three and not more than three of the data channels are configured to be used ...$C_{I,K}$

represents an orthogonal variable spreading factor code, I being a spreading factor and K being a

code number, wherein $0 \leq K < I$." Here, [a data channel is] configured to be used" means that data

is configured to be transmitted using the data channel or that the data channel is configured to be

transmitted. As discussed above, claim 229 recites the data on the first one and second one of

the channels being multiplied by a first spreading code, here $C_{4,1,}$ and the data on the third one of

the data channels being multiplied by a second, which here is specifically identified as $C_{4,3.}$,

wherein the first one of the data channels, the second one of the data channels, and the third

one of the data channels are configured to be used when three and not more than three of the

data channels are configured to be used. In addition to the failure of the Office Action to

identify why one of ordinary skill in the art would have been motivated to use one spreading

code for two channels and another spreading code for a third channel based on Ovesjo and

Yoshida, the Office Action fails to identify why it would have been obvious to modify the

already defective combination of Ovesjo and Yoshida *to use the specific codes of $C_{4,1}$ for the*

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data on the first one and the second one of the data channels and $C_{4,3}$ for the data on the third

one of the data channels, wherein the first one of the data channels, the second one of the

data channels, and the third one of the data channels are configured to be used when three

and not more than three of the data channels are configured to be used. Indeed, logically,

when two codes are used and the first code to be used is $C_{4,1}$, one would expect that *the second*

code to be used to be $C_{4,2}$, not $C_{4,3}$, because $C_{4,1}$ and $C_{4,2}$ are sequential to one another in the

OVSF code tree. Accordingly, for at least these reasons, the rejection of claims 229 and its

dependent claims should be withdrawn.

6.   Independent Claim 233 is Patentable Over the Combination of Ovesjo and
Yoshida

Claim 233 recites an apparatus for a mobile communication system comprising "an

allocation unit configured to allocate at least first data to a first one of the data channels, second

data to a second one of the data channels, and third data to a third one of the data channels, and a

multiplying unit configured to multiply the first data by $C_{4,1}$, the second data by $C_{4,1}$, and the

third data by $C_{4,3}$, *wherein the first one of the data channels, the second one of the data*

channels, and the third one of the data channels are configured to be used when three and not

more than three of the data channels are configured to be used, and $C_{I,K}$ represents an

orthogonal variable spreading factor code, I being a spreading factor and K being a code number,

wherein $0 \leq K < I$. " Here, [a data channel is] configured to be used" means that data is configured

to be transmitted using the data channel or that the data channel is configured to be transmitted.

As discussed above, claim 233 recites the data on the first one and the second one of the data

channels being multiplied by a first spreading code, here $C_{4,1}$, and the data on the third one of the

channels being multiplied by a second, which here is specifically identified as $C_{4,3}$, wherein the

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first one of the data channels, the second one of the data channels, and the third one of the data

channels are configured to be used when three and not more than three of the data channels are

configured to be used. In addition to the failure of the Office Action to identify why one of

ordinary skill in the art would have been motivated to use one spreading code for two channels

and another spreading code for a third channel based on Ovesjo and Yoshida, the Office Action

fails to identify why it would have been obvious to modify the already defective combination of

Ovesjo and Yoshida to *use the specific codes $C_{4,1}$ for the data on the first one and the second*

one of the data channels and $C_{4,3}$ for the data on the third one of the data channels, wherein

the first one of the data channels, the second one of the data channels, and the third one of the

data channels are configured to be used when three and not more than three of the data

channels are configured to be used. Indeed, logically, when two codes are used and the first

code to be used is $C_{4,1}$, one would expect that *the second code to be used to be $C_{4,2}$, not $C_{4,3}$*,

because $C_{4,1}$ and $C_{4,2}$ are sequential to one another in the OVSF code tree. Accordingly, for at

least these reasons, the rejection of claims 233 and its dependent claims should be withdrawn.

7.   Independent Claim 237 is Patentable Over the Combination of Ovesjo and
      Yoshida

Claim 237 recites an apparatus for a mobile station comprising: "a spreading unit

configured to spread at least a first one of the data channels by $C_{4,1}$, a second one of the data

channels by $C_{4,1}$, and a third one of the data channels by $C_{4,3}$, *wherein the first one of the data*

channels, the second one of the data channels, and the third one of the data channels are

configured to be spread by the one or more orthogonal variable spreading factor codes when

three and not more than three of the data channels are configured to be spread by the one or

more orthogonal variable spreading factor codes, and $C_{1,K}$ represents an orthogonal variable

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spreading factor code, I being a spreading factor and K being a code number, wherein $0 \leq K < I$."

As discussed above, claim 237 recites the first one and the second one of the data channels being spread by a first spreading code, here $C_{4,1}$, and the third one of the data channel being spread by a second spreading code, which here is specifically identified as $C_{4,3}$, wherein the first one of the data channels, the second one of the data channels, and the third one of the data channels are configured to be spread by the one or more orthogonal variable spreading factor codes when three and not more than three of the data channels are configured to be spread by the one or more orthogonal variable spreading factor codes. In addition to the failure of the Office Action to identify why one of ordinary skill in the art would have been motivated to use one spreading code for two channels and another spreading code for a third channel based on Ovesjo and Yoshida, the Office Action also fails to identify why it would have been obvious to modify the already defective combination of Ovesjo and Yoshida to *use the specific codes $C_{4,1}$ for the first one and the second one of the data channels and $C_{4,3}$ for the third one of the data channels, wherein the first one of the data channels, the second one of the data channels, and the third one of the data channels are configured to be spread by the one or more orthogonal variable spreading factor codes when three and not more than three of the data channels are configured to be spread by the one or more orthogonal variable spreading factor codes.* Indeed, logically, when two codes are used and the first code to be used is $C_{4,1}$, one would expect that *the second code to be used to be $C_{4,2}$, not $C_{4,3}$*, because $C_{4,1}$ and $C_{4,2}$ are sequential to one another in the OVSF code tree. Accordingly, for at least these reasons, the rejection of claims 237 and its dependent claims should be withdrawn.

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8.   Independent Claim 240 is Patentable Over the Combination of Ovesjo and Yoshida

Claim 240 recites a mobile station comprising: "a first spreading unit configured to spread at least a first one of the data channels by $C_{4,1}$ and a third one of the data channels by $C_{4,3}$; and a second spreading unit configured to spread at least a second one of the data channels by $C_{4,1}$, *wherein the first one of the data channels, the second one of the data channels, and the third one of the data channels are configured to be used when three and not more than three of the data channels are configured to be used,* and $C_{I,K}$ represents an orthogonal variable spreading factor code, I being a spreading factor and K being a code number, wherein $0 \leq K < I$." Here, [a data channel is] configured to be used" means that data is configured to be transmitted using the data channel or that the data channel is configured to be transmitted. As discussed above, claim 240 recites the first one and the second one of the data channels being spread by a first spreading code, here $C_{4,1}$, and the third one of the data channels being spread by a second, which here is specifically identified as $C_{4,3}$, wherein the first one of the data channels, the second one of the data channels, and the third one of the data channels are configured to be used when three and not more than three of the data channels are configured to be used, and $C_{I,K}$ represents an orthogonal variable spreading factor code. In addition to the failure of the Office Action to identify why one of ordinary skill in the art would have been motivated to use one spreading code for two channels and another spreading code for a third channel based on Ovesjo and Yoshida, the Office Action also fails to identify why it would have been obvious to modify the already defective combination of Ovesjo and Yoshida to *use the specific codes $C_{4,1}$ for the first one and the second one of the data channels and $C_{4,3}$ for the third one of the data channels, wherein the first one of the data channels, the second one of the data channels, and the third*

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one of the data channels are configured to be used when three and not more than three of the data channels are configured to be used. Indeed, logically, when two codes are used and the first code to be used is $C_{4,1}$, one would expect that *the second code to be used to be $C_{4,2}$, not $C_{4,3}$*, because $C_{4,1}$ and $C_{4,2}$ are sequential to one another in the OVSF code tree. Accordingly, for at least these reasons, the rejection of claims 240 and its dependent claims should be withdrawn.

        9.   Independent Claim 243 is Patentable Over the Combination of Ovesjo and Yoshida

Claim 243 recites a method for a mobile station comprising: "spreading a first one of the data channels by $C_{4,1}$; spreading a second one of the data channels by $C_{4,1}$; and spreading a third one of the data channels by $C_{4,3}$; *wherein when the mobile station transmits three and not more than three of the data channels, the first one of the data channels, the second one of the data channels, and the third one of the data channels are transmitted*, and $C_{I,K}$ represents an orthogonal variable spreading factor code, with I being a spreading factor and K being a code number, wherein $0 \leq K < I$." As discussed above, claim 243 recites the first one and the second one of the data channels being spread by a first spreading code, here $C_{4,1}$, and the third one of the data channels being spread by a second, which here is specifically identified as $C_{4,3}$, wherein when the mobile station transmits three and not more than three of the data channels, the first one of the data channels, the second one of the data channels, and the third one of the data channels are transmitted. In addition to the failure of the Office Action to identify why one of ordinary skill in the art would have been motivated to use one spreading code for two channels and another spreading code for a third channel based on Ovesjo and Yoshida, the Office Action also fails to identify why it would have been obvious to modify the already defective combination of Ovesjo and Yoshida to *use the specific codes $C_{4,1}$ for the first one and the second one of the data*

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channels and $C_{4,3}$ for the third one of the data channels, wherein when the mobile station transmits three and not more than three of the data channels, the first one of the data channels, the second one of the data channels, and the third one of the data channels are transmitted. Accordingly, for all of these reasons, the rejection of claims 243 and its dependent claims should be withdrawn..

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CONCLUSION

In view of the foregoing amendments and arguments, it is respectfully submitted that this application is in condition for allowance. If the Examiner believes that prosecution and allowance of the application will be expedited through an interview, whether personal or telephonic, the Examiner is invited to telephone the undersigned with any suggestions leading to the favorable disposition of the application.

It is believed that all necessary fees are being charged for filing this Response. However, the Director is hereby authorized to treat any current or future reply, requiring a petition for an extension of time for its timely submission as incorporating a petition for extension of time for the appropriate length of time. Applicants also authorize the Director to charge all required fees, fees under 37 C.F.R. §1.17, or all required extension of time fees, to the undersigned's Deposit Account No. 50-0206.

Respectfully submitted,
HUNTON & WILLIAMS LLP

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